BOTANICAL GAZETTE.

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EUCALYPTUS GLOBULUS.—Having been led to raise the *E. globulus* from seed for experimental purposes, the last summer, the plant afforded opportunities for some quite interesting observations. This tree is not only remarkable for its rapid growth when young, but equally so for some curious eccentricities of character. To those familiar with the growing "Blue Gum," probably these observations are not new; but to the readers generally of the GAZETTE, they will prove interesting, as they certainly were to the writer. Sown in March, in a flower-pot in the sitting room, the seeds pushed up each a pair of bright red cotyledons. The young tree, even when of respectable height, say 15 feet, presents a crowd of specific differences, as species in plants are to-day determined. There would be no difficulty with a young "Blue Gum" on his table, for the teaching botanist to illustrate a variety of leaf characteristics, considered constant and as specific distinctions in other genera. And when the flowering age comes, the adult tree demurely abandons these early inconstancies. In thrifty growing specimens, the young *E. globulus* has a four-sided stem like the labiates, with sharp thin extensions at the corners. The leaves like those of our own deciduous trees, present the upper side to the sunlight, with one side, as a matter of course in the shade. They are sessile, with the base notched or heart-shaped, and they are opposite, thus the ears or lobes of the notch of one leaf lap or lie upon the corresponding parts of its fellow opposite, looking at a little distance as if they might be perfoliate, much as appear the upper leaves of the *Lonicera* or Woodbine. Now in the adult tree the leaves are long petiolate, and very long lanceolate. They are also alternate, and to crown the eccentricity of habit, they are arranged edgewise to the sun-light; that is, the upper and the under plane of the leaf are equally exposed to the sun. In dried specimens before me from Santa Barbara, Cal., I find that these great lanceolate leaves are decidedly falcate, and the queer thing is that the concave edges of these scythe-like leaves, are invariably set uppermost. It is observable, too, that while the leaves of the young individuals are glabrous and dark green above, and the undersides are pale, and a little glaucescent, and the mid rib is of course most prominent below, and the resin glands most conspicuous there these conditions disappear in the leaves of the older tree. Now the glabrous-green has gone and both sides of the leaf are of a whitish hue, and the glands are equally discernable on either side—and strange indeed! the mid-rib and the cardinal veins are nearly equally prominent on either side of the leaf.

The growth of this Blue Gum is truly astonishing. In May of this year Dr. R. E. Kunze, of New York, set a plant two feet high, taken from a conservatory, in his back yard. On the 10th of October it was about 12 feet high! Allowing the proper time for it to rally from the shock of transplanting and change of place, it must have averaged an inch of growth per day.—SAMUEL LOCKWOOD, *Freehold, N. J.*

BRYOLOGICAL NOTES. BY C. F. AUSTIN.—TRICHOSTOMUM ? SUBDENTICULATUM, *n. sp.*—Humile, fusco-viride; foliis siccitate involuto-crispatis humiditate patentibus e basi angustata canaliculata caulem ad ¾-amplectente late elliptico-oblongis non nullis convoluto-concavis aliis planiusculis, margine nec recurva nec crenulata versus basin late undulata versus apicem obtuse mucronatem minutissime denticulata, dorso minutissime papilloso, costa valida flavescente vel subrufa lævi percurrente,

cellulis minutissimis subnitidis (vix granulosis) rotundo-quadratis, basilaribus majoribus magis minusve pellucidis (sæpe (?) subfuscis): cætera ignota.

With *Tortula agraria* and *T. Donnelli*, on shell banks, in the Everglades of Florida, March, 1877, *J. Donnell Smith*.

The most striking characteristics of this moss are its short stems, broadly elliptico- or lanceolate-oblong obtusely mucronate leaves from a much narrowed pellucid almost vaginal base, with the margins somewhat undulate (at least towards the base), some nearly plane, others strongly convolute-concave above, immarginate, neither recurved nor papillose-crenulate on the margin, remotely and minutely denticulate towards the apex, very minutely and closely papillose on the back, costa stout, smooth and percurrent, cells at the base considerably enlarged, the ordinary ones most minute and scarcely granulose.—Possibly a species of *Tortula*; but apparently allied to *Trichostomum* (*Didymodon*) *riparium* (*Pottia riparia*, AUST. Musc. Appalach.); but that has the leaf never so strongly concave, with a shorter less clasping base, a more distinctly dentate or often coarsely serrate apex, the back less closely papillose, cells twice as large,—the basilar ones less pellucid; color more brown, &c.

The following additional notes were made in comparing with other species:

Tortula agraria, HEDW., is a little smaller, with the leaves more spatulate, more acute, composed of larger cells, &c. Cells of the leaf quadrate, not granulose nor opake, distinctly defined, the basilar ones considerably enlarged and truncate; perichætial leaves (2) scarcely convolute, oblong or lanceolate-ovate, acutish, heavily costate; outer capsule-wall composed of rather large and broad cells; peristomal teeth flattish (*tæniate*), with a pellucid medial line, papillose, much twisted, dark red: stems very short. A small species.

Tortula Rauei, AUST. (Torr. Club Bull. VI., p. 43,) is nearest to *T. agraria*; but the leaf is more ovate, much more concave, more crisped when dry, more acute; cells opake and granulose, less quadrate,—the basilar ones more enlarged, less truncate at both ends; perichætial leaves thinner, broader, strongly convolute, often obtuse, very lightly (or even obsoletely) costate; outer wall of the capsule composed of smaller and narrower cells; peristomal teeth terrete, without a medial line.

T. cæspitosa, HEDW. has the leaf granulose, more undulate, cells larger and each bearing 2 or more papillæ on its back, the papillæ projecting beyond the otherwise entire margin, thereby giving it a crenulated appearance.

Calympores Richardi, C. M. has somewhat narrower leaves, which are broadly margined towards the base, the margins above involute and entire; basilar cells much larger and more hyaline and extending much farther up the leaf; ordinary leaf-cells a trifle larger, more acutely angular, closer, and when viewed under the microscope with transmitted light they exhibit a single papilla on the back of each as a minute shining speck.

Tortula recurvifolia, SCHIMP.—I found a few stems of this species, mixed with *T. intermedia* (BRID.) in crevices of rocks near the Weehawken Oil Docks, N. J., and also at Suffern, N. Y., in 1866. Messrs. Wolle and Rau and myself found it in Watkin's Glen, and I also found it at Niagara Falls, in 1874. Some one, Mr. Warne, I think, has sent it to me from Colorado, and both Mr. Macoun and Mrs. Roy have sent it from Canada. The Canada specimens are very small and slender, with the leaves short and mostly not recurved. All the specimens are sterile.

Tortula Closteri, AUST., (in BOT. GAZETTE, I., p. 29,) is characterized by its sublinear, or oblong-lanceolate subcarinate remarkably granulose leaves, very slightly recurved on one of the margins below the middle, with a minute hyaline apiculus; apex of the leaf often strongly recurved.—Closter and Camden, New Jersey. Also, Gainesville, Florida, *Ravenel*. Very rare; sterile.

TORTULA DONNELLII, *n. sp.*—Dioica, parvula, gregario-cæspitosa; caule 1-2 lineas alto nonnullo sub gracili, foliis sicitate valde involuto-crispatis in humore subpatentibus subspathulatis oblongo- junioribus -ovatis senioribus-lanceolatis acutiusculis et acutis submucronatis profunde canaliculato-concavis (senioribus subcarinatis), dorso scabriusculo, facie interiore ob cellulas prominulas subpapillosa, margine erecto-involuto (sæpe in medio adspectu incrassato) haud limbato apice minute obsoleteve serrulata, costa valida percurrente sublævi, cellulis permiuutis rotundo-quadratis haud granulosis, illis in foliis junioribus homogenis, basilaribus in senioribus longioribus vix latioribus paulo pellucidioribus: fructu et pl. masc. ignota.

Banks of the St. Lucie River (with *T. agraria*), *John Donnell Smith.*

About the size of *T. agraria* and *T. Rauei*, and not readily distinguished from them; but they both have shorter stems, with the male and female plants growing together, broader more spatulate, more acute, less concave leaves, composed of larger cells, the basilar ones much broader and more pellucid. Furthermore, the former is distinguished by its leaves being but slightly crisped when dry; and the latter by its granulose leaves.

GRIMMIA SUBINCURVA, *n. sp.*—Caule erecto compacte cæspitoso simplici vel apicem versus furcato, foliis subconformibus indistincte spiraliter tristichio siccitate tortilibus madefacte erecto-apertis ovatis et ovato-lanceolatis canaliculato-carinatis lævibus, apice angusto mutico subincurvo, margine plano vel hic illic anguste recurvo, costa mediocri percurrente, cellulis parvis haud granulosis illis versus apicem subquadratis illis a medio versus basin paulo latioribus sesquiquadruplo longioribus paulo pellucidioribus haud sinuosis: cætera ignota.

On rocks, Colorado, *Brandegee* (*Rau*).

Size (small) and mode of growth much as in *G. conferta*; but that has the leaf usually hyaline-apiculate, or often shortly piliferous, margin more recurved, cells smaller, those below much smaller and less elongated. Color and general appearance of *Zygodon Mongeotii* with which it was found growing, but from which it is readily separated by its much shorter obtusish not granulose leaves, composed of larger cells, those below more elongated, &c.—The species is chiefly characterized by the mutic, subincurved apex of the leaf. Cells in the upper part of the leaf often broader than long, slightly obscure.

HYPNUM (*Rhynchostegium*) ROYÆ, *n. sp.*—Dioicum; caule rigido tenui gracili stricto parce ramoso rigido subcompresso, foliis dissitis erectiusculis et semipatentileus ovatis et ovato-lanceolatis acute acuminatis leviter concavis toto margine plana minute serratis ultra medium costatis, cellulis mediocribus ovali- et oblongo-rhombeis lævibus; flore fœm. magna, foliis perichætialibus e basi oblongo-ovata longe subulato-acuminatis ecostatis (exterioribusve leviter costatio), acumine squarroso subserrato, paraphysibus compluribus longis: cætera ignota.

California, *Mrs. Jessie Roy.*

A small species; not larger than the usual forms of *H. serpens*, distinguished by its straight stems, distant erectish leaves, &c.

HYPNUM (*Rhynchostegium ?*) BRANDEGEI, *n. sp.*—Dense cæspitosum, aureo-viride, subintens; caule subunciali erecto subsimplici tumidulo compressiusculo, foliis imbricatis late ovatis concavis late 2-3 plicatis abrupte breviuscule subulato vel piliformi-acuminatis, margine plana integerrima obsoleteve serrata, costa simplici vel bicrura vix ultra medium producta, cellulis laxiusculis anguste oblongo-fusiformibus strictiusculis basilaribus paulo latioribus brevibus et brevissimis: cætera ignota.

Colorado, *Mr. Brandegee*, (*Rau*).

Near the European *Hypnum murale*, HEDW.; but that has the leaves rather more concave, always more acuminate (never piliferous), and furnished with a stouter and

longer costa, and with narrower and more vermicular cells. *H. piliferum*, SCHREB., has much longer often subpinnate stems and serrate leaves with a longer pilum and different areolation.

Hypnum Coloradense, AUST., (BOT. GAZETTE, II., p. 111,) is also a somewhat similar moss; but is much more robust, with rather more compressed stems, and oblong-ovate leaves, furnished with a much longer pilum, and composed of much longer and narrower cells.

I have lately received a moss from Mrs. Roy, under the name of "*Hypnum cariosum*." collected in Scotland by Rev. J. Ferguson, which is about the size of *H. Coloradense*, and has the same piliferous and concave leaf; but differs from it, as well as from the other species mentioned above, in having the leaf distinctly auricled, the auricles minute and composed of somewhat inflated cells; the rest of the lowermost alar cells are very minute, subsolid and opake.

There is a compact form of *Hypnum acuminatum*, BEAUV., which occurs abundantly on the roots of trees in woods about Closter, which somewhat resembles H. BRANDEGEI, but it is of a dark green color, the leaves are more plicate, with the apex less abruptly and never piliferously acuminate, the margins more or less recurved and serrate, costa always single, &c.

THE CONIFERÆ OF THE CRESTONES.—The Crestones are pinnacles of rock on the Sangre de Cristo spur of the Rocky Mountains, rising to an elevation of 14,200 feet above sea level The altitude of timber line is about 12,000 feet, but as most of the *Coniferæ* upon the northern slope have been killed, it does not appear so plainly marked as in many parts of the Rocky Mountains. At 10,000 feet altitude, all the *Coniferæ* of Colorado excepting *Juniperus Virginiana* and *occidentalis and Pinus edulis* can be seen growing together. *Abies Engelmanni* is the most abundant tree above 10,500 feet altitude, and *A. concolor* the predominant conifer below that altitude.

Pinus contorta, Dougl., is abundant upon some dry ridges and is generally so small that hardly any of it can be called trees. Its leaves are persistent seven years and its cones very many years. Old dead trees are full of the persistent cones. Nothing but wings of seeds could be found in these old unopened cones.

Pinus ponderosa, Dougl., is found up to 10,000 feet altitude. It bears *Arceuthobium robustum* in great quantities. This pine often throws its parasite-bearing limbs and branches amongst those of other pines and spruces, but the *Arceuthobium* grows only upon those of *P. ponderosa*. Its leaves are persistent six and seven years. The cones begin to open about the first of October, the scales opening first at the base.

Pinus flexilis, James, is not common, but single trees are found scattered about up to an elevation of 11,000 feet. The leaves are persistent three and four years. The seed falls between Sept. 8th and 20th, those growing at low altitudes ripening first. Some seeds near the base of the cone are held in by the scales not opening wide enough to let them fall.

Pinus aristata, Engelm., is common at timber line and like many alpine plants comes down to a lower altitude. Here it is found at 10,000 feet, and west of Pike's Peak I have seen it below 8,000 feet altitude. Trees at 11,000 were beginning to drop their seed Oct. 6th. Its leaves are persistent 12 and 13 years.

Abies Engelmanni Parry. The lower limit of this species is 10,500 feet, but many trees come down to near 9,000 feet, generally, however, growing in shaded situations. The dwarfed, prostrate, cone-bearing trees are plenty at timber line, but the very large magnificent forms of the western slope are not found in the Crestones. It is a very variable species. The branchlets may be either pubescent or smooth and shining, so that it cannot be separated from *A. Menziesii* by this character alone. At higher altitudes the branchlets are always pubescent, but at its lower elevations they are often

smooth. Rarely a tree is cone-bearing upon every branch. The cones vary in color, size and shape, but are always small compared with those of *A. Menziesii*. Almost every tree bears a different variety of cone; sometimes they are not one inch long, sometimes purple, sometimes light colored. They may have the tips of the scales appressed or spreading, and are often oval in shape; often cigar-shaped, and forms connecting the extremes of their variation are abundant. The scales of the cones open wider than those of *A. Menziesii*, and the seed at the same altitude falls a week earlier, beginning before Sept. 15th. Young trees ripen their fruit first, which is true of all our species of *Abies*. On the tree, the scales open first at the tips of the cone, in heaps at the base. In heaps they give up their seed very much more readily than *A. Menziesii*. The average yield of seed to a tree is one-quarter of a pound. The difference between this species and *A. Menziesii* in the rigidity of the leaves growing with the cones is pleasantly noticeable to one picking the cones. The leaves in all species of Colorado *Abies* are persistent 12 and 13 years. This species forms buds along the annual growths, so that the young trees do not have the regularity of growth of *A. Menziesii*. It is always readily distinguished from the latter by its smooth scaly bark.

Abies Menziesii, Lindl., is not plenty in the Sangre de Cristo. It grows along the streams and in damp localities up to its highest altitude—10,000 feet. The branchlets are smooth and shining, but sometimes show a decided tendency to pubescence. The horizontal limbs of old trees are crowded with small drooping branches, which so well mark a grove of these trees that they can be distinguished many miles distant. The scales of the green cones are free at their tips; the cone is long conical-shaped. Young trees begin to ripen their seed Sept. 15th. The average yield of seed is one-half pound to a tree.

Abies subalpina, Engelm., (*A. grandis* of the Colorado botanists, not of Douglass. *A. lasiocarpa*, Hook. Flor?) This conifer comes down to below 10,000 feet altitude, but is most common at high elevations. The trees are small and slender, never equaling those of the western slope of the Rocky Mountains. The cones are few, always dark purple in color, and fall to pieces before October 1st. There are two varieties: one bearing many short leaves, the other bearing fewer long spreading leaves. Growing with *A. concolor*, it is readily distinguished by its smoother, white bark, its shorter less falcate leaves and more slender form of growth. The wood is soft and the heart wood slightly darker.

Abies concolor, Lindl., grows upon ridges, slopes, rocks and along the creeks up to 11,000 feet altitude. The main trunk of the tree often is divided and branched near the top. Old trees have a very rough, ridged bark. At higher elevations the bark becomes smoother, but can not be mistaken for that of *A. subalpina*. It bears many cones and is often cone-bearing to the middle of the tree. The cones are of two colors: about half the trees bearing apple-green cones and the others cones of a dark purple color. There are two varieties as to leaves, but not associated with any one color of cone: one variety with the leaves short, crowded, turning upward, the other with long, spreading leaves corresponding to the two varieties of *A. subalpina*. The yield of seed is about one pound to a tree. The cones begin to break up September 20th.

A. Douglasii, Lindl., grows upon the ridges as high as 11,000 feet. Out of one hundred trees chopped, ninety-eight fell toward the east. One very small one was pushed westward by main strength, and the other had such a crooked trunk that it could not possibly fall eastward. The cones are nearly all borne upon the east side of the tree. Trees that are in fruit this year were also in fruit last year, which was not generally the case with the other species of *Abies*. The cones begin to open September 25th; large trees bear about one-twelfth of a pound of seed. Half of the cones are stung by insects.

Juniperus communis, L., var. *alpina*, L., is plenty at all altitudes and is full of fruit. —T. S. BRANDEGEE, *Canon City, Colorado.*

COLORADO FUNGI. (NEW SPECIES.)—BY CHAS. H. PECK.—The species of fungi here described were collected in Colorado by *Mr. T. S. Brandegee*, and forwarded to me for examination by *Mr. E. S. Rau*, of Bethlehem, Pennsylvania.

SPHÆROPSIS RAUI, *Pk.*—Spots indefinite, brown; perithecia numerous, gregarious, minute, phomatoid, sub-membranaceous, black, .006–.007 inch in diameter; spores obovate or oblong, colorless, .00065–.00075 inch long.

Living leaves of *Artemisia scopulorum*, Gray.

LECYTHEA SPECIOSA, *Pk.*—Spots suborbicular, one to two lines in diameter, yellow; sori few, crowded, prominent, hypophyllous, orange-colored; abortive spores elongated, curved, obtuse, nearly cylindrical; spores sublogose or elliptical, .001–.0012 inch long, rough, the endochrome bright orange.

Living leaves of *Rubus deliciosus*, Torr.

This is probably the early or Uredo form of some species of Phragmidium which should be sought later in the season. It is distinguished from its allies by the deep orange color of the sori, and the narrow elongated abortive spores.

ÆCIDIUM BRANDEGEI, *Pk.*—Peridia amphigenous, scattered or aggregated, sometimes seriately placed, elongated; spores subglobose, orange colored, .0008–.001 inch in diameter.

Living stems and leaves of *Asclepias verticillata*, L.

The peridia resemble those of *Æ. Thalictri*, but the spores and habit of the plant are quite different. It occupies the stem and leaves in patches of considerable extent and changes the aspect of the host plant.

ÆCIDIUM HEMISPHÆRICUM, *Pk.*—Peridia prominent, scattered or crowded, hemispherical, opening by a small aperture; spores orange, subglobose or elliptical, .0008–.001 inch long, the epispore thick, hyaline.

Living stems and leaves of *Mulgedium pulchellum*, Nutt.

The peridia are generally more scattered on the stem than on the leaves, the whole lower surface of which is often occupied by them.

ÆCIDIUM POROSUM, *Pk.*—Spots none; cups crowded, deep-seated, broad, wide-mouthed, occupying the whole lower surface of the leaf to which they give a porous appearance; spores orange-colored, sub-angular, .0008–.001 inch in length.

Living leaves of *Vicia Americana*, Muhl.

This species is quite distinct, both in its spores and in the size and character of the peridia, from *Æ. album*, Clinton, which also inhabits *Vicia Americana*.

ÆCIDIUM ABUNDANS, *Pk.*—Spots yellow, numerous, small, sub-orbicular, sometimes confluent; peridia few, hypophyllous, sub-circinating, pustulate; spores sub-globose, orange, .001 inch in diameter; spermogonia on both sides of the leaf on the same or on different spots.

Living leaves of *Symphoricarpus oreophilus*.

The leaves of the host plant are beautifully mottled by the spots. The peridia in the specimens seen are nearly all closed, from which it is probable that they are scarcely mature.

ÆCIDIUM BIGELOVIÆ, *Pk.*—Spots thickened, yellow; peridia pustulate, hemispherical, opening by a small aperture; spores sub-globose, bright yellow or orange, .001–.0013 inch in diameter.

Living stems and leaves of *Bigelovia Douglasii*, Gray.

The peridia resemble those of *Æ. hemisphæricum*, but the species is at once distinguished by the yellow spots and larger spores.

UROMYCES HYALINUS, *Pk.*—Spots none; sori numerous, hypophyllous, at first covered by the hyaline membranous epidermis, at length exposed, effused, nearly or quite

occupying the whole lower surface of the leaf, ferruginous-brown; spores ovate or oblong-ovate, umbonate at the apex, .001–.0013 inch long; pedicel hyaline, short.

Living leaves of *Sophora sericea*, Pursh.

Mr. Brandegee remarks concerning this fungus that it is very common at Canon City, about one-half the Sophora plants being affected by it. The plants attacked by it become more erect in habit and do not blossom. The sori sometimes occur sparingly on the upper surface of the leaf also. The specific name is suggested by the hyaline membrane that at first covers them.

PUCCINIA NIGRESCENS, *Pk*.—Spots none; sori rather prominent, cauline, oblong, blackish-brown or black; spores smooth, elliptical or oblong, obtuse or bluntly pointed, slightly constricted at the septum, .0015–.0018 inch long, .0008–.001 broad; pedicel colorless, two to four times as long as the spore.

Stems and branches of *Salvia lanceolata*, Willd.

No leaves of the host plant accompanied the specimens sent, so that I am not able to say whether the fungus ever attacks the leaves or not.

The two following species have been received from the sources given at the end of the descriptions:

DIATRYPELLA FROSTII. *Pk*.—Stroma verrucæform, rather prominent, convex or hemispherical, scarcely one line broad, sometimes confluent, partly covered by the closely adhering fragments of the ruptured epidermis, black externally, greenish within, forming a white spot on the wood beneath; perithecia sub-globose, generally ten to fifteen; ostiola obscure; asci sub-cylindrical, scarcely pedicellate, polysporous; spores yellowish in the mass, cylindrical, curved, .00025–.00035 inch long.

Dead maple branches. Brattleborough, Vermont. *C. C. Frost.*

Externally this fungus resembles small forms of *Diatrypella verrucæformis*, from which it is easily separated by the greenish color of the stroma. *D. betulina*, which also has a greenish stroma, differs from this species in the larger size, different form and naked disk.

SOROSPORIUM DESMODII, *Pk*.—Spore balls irregular or sub-globose, compact, rough, .0012–.0016 inch in diameter, color in the mass reddish-brown inclining to cinnamon; spores sub-globose, rough, .0006–.0007 inch in diameter, four to ten in a group, not easily separating from each other.

Seeds of *Desmodium acuminatum*, DC. Closter, New Jersey. *C. F. Austin.* September.

I am not aware that any representative of this genus has before been detected in the United States. Nor is it surprising that this species has so long escaped notice, for the fungus is wholly concealed, being produced in the seeds while they are yet inclosed in the pod. For a time there is no external evidence of the presence of the fungus, but at length a slight discoloration of the part of the pod immediately over the affected seeds indicates that all is not right within.

The whole seed, except perhaps the thin external coat, appears to be transformed into the fungus spores. The color of these is similar to that of the spores of *S. Saponariæ*, but the spore masses are smaller and less easily separated into their component spores. Every seed in a pod and nearly every pod on an affected plant, so far as shown by the specimens sent me, is attacked. From this it would appear that the fungus must be quite effective in preventing the increase of this Desmodium by the seed in localities where it abounds.

MORE ABOUT LOBELIAS.—In the April number (1877) of the GAZETTE I mentioned having found a white plant of *Lobelia syphilitica* I now have to report not only a *red* flowered plant of the same species, (differing in no particular, except in color, from the common form,) but a remarkable plant which appears to be a hybrid between *L. syphi-*

litica and *L. cardinalis*. A careful comparison shows the following peculiarities: Leaves and calyx nearly as hairy as those of *L. syphilitica*; bracts intermediate; the flowers have the slender tube and the aspect of *L. cardinalis*, but broader at the mouth and with more conspicuous folds in the throat, nearly as large as in *L. syphilitica*. It has also the reflexed calyx sinuses of the latter species, but they are very short. The color is remarkable, and led to the discovery of the plant, being a deep reddish or crimson-purple; different from any plant I can now call to mind. It grew in the midst of a patch of *L. syphilitica* in low, moist woods; no plants of *L. cardinalis* nearer than two hundred yards, at which distance there were several There were but *two* plants of the hybrid.—J. SCHNECK, *Mt. Carmel, Ill.*

I have received and examined a specimen of this interesting plant, and I have no doubt that it is rightly considered to be a hybrid between *Lobelia syphilitica* and *L. cardinalis*. I never saw the like of it before.—ASA GRAY.

MISTLETOE PARASITIC ON ITSELF.—The Mistletoe (*Phoradendron flavescens*) abounds in Florida, where it may be found on nearly every kind of tree. We know of one plant of it growing on a low *Prunus Chicasa*, only eight feet from the ground; but it attains its greatest development on the lofty branches of old oaks, where a single plant frequently attains the size of a hogshead. Having a fine oak which had become overrun by this parasite to an extent which endangered the life of the tree, we recently had the mistletoe cut off. It would have required a hay-rack to carry it away at one load, for it equalled in amount the natural foliage of the tree. The fertile and sterile plants were about equal in number, size and color, but all were more *flavescent* than those growing on less burdened trees. We were not before aware that any plant ever grew on another of its own species, but here we found two instances of this phenomenon. In one case a staminate plant grew on a staminate, and in the other a pistillate on a staminate. In both cases the double parasitism was proved by the fact that the secondary plants sprung from internodes, and in the last the proof was rendered doubly strong by the dioecious character of the plant.

It would be interesting to know how the mistletoe compares in northern and southern latitudes as to germination and maturing of fruit. In Florida both are about simultaneous, but in the Northern States it would seem that an interval of several months must intervene. If so, there must be a much greater waste of seed, and probably the seed finds secure lodgment and germinates mainly on rough-barked trees. The distribution of the mistletoe must be effected mainly through the agency of birds, and yet it seems almost impossible that so soft a berry can pass through the digestive system without losing its vitality. At any rate the special adaptation of the fruit is for ready adhesion to external objects. Even to planed boards it adheres with almost the tenacity of glue. In this lattitude the berries of the mistletoe are too green at Christmas to be of interest for decoration except from association. Towards the close of winter the pulp becomes thin and gelatinous, and the germ begins to grow and turn green within its nourishing and translucent envelope. In this condition the berries are readily beaten off by the spring rains and winds on to other branches, when the germs, already highly developed, quickly pierce through the bark to the nourishing streams of sap flowing beneath.

It would seem that the mistletoe, being green throughout, was specially adapted for the elaboration of sap, and that it ought to assist the tree in this office, if for no other reason than to maintain the health of the latter. Such services are sometimes performed by animal parasites, but common observation goes to show that vegetable parasites take only and give nothing. That this is true of the mistletoe is indicated by the fact that the portion of the branch beyond its insertion frequently dies, when the remaining portion ceases to grow. In such cases the mistletoe will continue to grow until its diame-

ter exceeds that of the sustaining branch, which being overweighted, can no longer support the parasite except in a pendent position.—A. H. CURTISS, *Jacksonville, Florida.*

A CONVENIENT MICROSCOPE.—I have been so frequently consulted of late as to the best form of dissecting microscope for botanical purposes, that I am glad to be able to say our well-known Optician, Mr. Joseph Zentmeyer, of Philadelphia, has just constructed one that in all respects is what the analytical botanist requires. Mr. Zentmeyer needs no word of mine to commend his work. It is in the interest of botony that I write this.

The stand is round, of cast iron, and six inches in diameter. Hence the instrument is perfectly steady. The pillar supporting the stage is strong, of brass, and three inches high. Of just such a height that the hands holding the needles are free from tremor because the arms rest solidly on the table. The stage of brass is five inches long by nearly four wide, and *stationary*, thus contrasting most favorably with the old Raspail, and some of the later instruments. There is a glass plate nearly two inches in diameter in the middle of the stage, and abundant light is thrown on this from the mirror beneath. The arm carrying the lens is raised or lowered by a firm, and charmingly smooth working rach and pinion, which has a free lateral movement. A good lens magnifying about ten diameters completes this model instrument. Its advantages are: stredgth, neatness and a large steady stage, over all the cheaper instruments of this class, and it has all the good points of the finer dissecting microscopes at about half the cost. The glass plate in the stage may be removed and a watch glass put in, to contain any object we wish to examine in water, or an alcohol lamp placed under the stage will keep up the gentle heat we sometimes want in work.

The instrument as I have described it with a neat box, costs only fifteen dollars, and one dollar more would add an extra, higher-powered lens, thus making it equal to any work involved in analytical botany. Beside this, a tube might be added to screw into the arm carrying the lens, and thus at a very small additional expense the owner would have a compact, strong compound microscope that would do good field work with even a quarter or a fifth of an inch objective. For the botanical laboratories of Colleges it has no superior, when we consider economy and durability.—J. T. ROTHROCK.

MONOTROPA UNIFLORA.—Notwithstanding the pretty general distribution of this peculiar type of vegetation, its comparative numerical paucity in any region appears as rather a striking feature. In many hundreds of botanical walks we have found but one locality where this plant seems anyways abundant. This was in what is known as the "Beech and Oak Flats" of Jefferson county, Indiana. The timber is often quite dense, and the vegetable debris has often formed to quite a thickness by natural accumulation from year to year, and at the same time being aided by the presence of water except in the dryest seasons. Under such circumstances vegetable products of a fungus type are readily encouraged in growth. Here within the compass of a few square yards, and among the beech roots, we have secured as many as 50 fine specimens. However, in contemplating their beauty of form and delicacy of structure, we did not suspicion such a poisonous principle to lurk within as we have since found to be the case.

During the month of September a young lady brought me a plant which she said had poisoned her, and she desired its name. With some surprise, and perhaps I should have had none after considering its fostering food and close resemblance to the Fungi, I found the plant to be *Monotropa uniflora*. The circumstances of the case are as follows. The young lady while examining the plant accidentally crushed the stem, and some of the juice was driven upon her lips. The mucous portions which were somewhat chapped became very much irritated, and began to inflame and swell consider-

ably; while in two or three places upon the epidermal skin of the lip, small ulcerous sores were formed The effect remained some four or five days and then gradually healed. The whole appearance was very much like a mild case of poisoning with *Rhus toxicodendron*.—A. H. Y., *LaFayette, Ind.*

COREOPSIS ARISTOSA, MICH.—It will be interesting to botanists to have published in the GAZETTE observations on the seeds and awns of *Coreopsis aristosa* from numerous localities, to ascertain if the awnless or upwardly or downwardly barbed awns are inherent in the species, or if their anomalous development is incidental and attributable to the introduction of Bidens in the species. Here where the species largely abounds the awnless with upwardly and downwardly barbed awns are relatively about equal in all the localities I have examined the past season, where *Bidens frondosa* is numerously mixed in with the growth, and also where no species of the genus now abounds, would seem to indicate that the trait is an inherent one. And thus invalidating the most important character separating the two genera. If the species is found to be normally awnless, as is quite probable, and the awns due to Bidens, the upward and downward barbs would still be a puzzle, unless it should turn out to be that both forms of barbs are common also to Bidens, which is already almost established in the case of *Coreopsis discoidea*, which is sometimes a perfect *Bidens frondosa* in all except the upwardly barbed awns. The allied species *Coreopsis trichosperma*, should also be examined for similar anomalies whereit abounds. The species is absent from this section. Observations are needed in localities where Bidens is absent, and in all habitats the relative proportion of the three forms should be noted.—E. HALL.

LATE FLOWERS.—I found the following list of plants still in flower on October 2d and 3d, in Exeter, R. I. It may possibly interest some western readers to see what are our late flowering eastern species. I have not classified the names, but have written them somewhat in the order in which the specimens were found. It will be noticed that some are early plants enjoying a second bloom:

Viola cucullata.
Gerardia purpurea.
" *quercifolia.*
Solidago linoides.
cæsia.
nemoralis.
elliptica.
odora.
Canadensis.
bicolor.
Aster corymbosus.
Novæ Angliæ.
lævis, var. *cyaneus.*
cordifolius.
longifolius.
Tradescanti.
multiflorus.
dumosus.
undulatus.
patens.
Gnaphalium polycephalum.
Antennaria margaritacea.
Hypericum Sarothra.
Œnothera biennis.
Lobelia cardinalis.
Trichostema dichotomum.
Brunella vulgaris.
Polygala cruciata.
" *sanguinea,*
" *verticillata.*
Linaria Canadensis.
vulgaris.
Pedicularis lanceolata.
(new to Rhode Island.)
Polygonum incarnatum.
" *dumetorum.*
" *articulatum.*
" *arifolium.*
Diplopappus linariifolius.
" *umbellatus.*
Spiranthes cernua.
Trifolium pratense.
arvense.
Potentilla argentea.
Nabalus Fraseri.
Hieracium Canadense.
" *venosum.*
Lepidium Virginicum.

Eupatorium pubescens.
" *perfoliatum.*
" *purpureum.*
Spiræa salicifolia.
Krigia Virginica.
Sisymbrium officinale.
Linum sulcatum.
Barbarea vulgaris.
Taraxacum Den-leonis.
Gentiana Andrewsii.

Out of bloom I noticed quantities of *Aletris farinosa*, *Hudsonia ericoides*, *Tephrosia Virginica*, *Ilex verticillata*, *Crataegus coccinea*, *Cephalanthus occidentalis*, *Ampelopsis quinquefolia*, *Cornus florida*, *Myrica cerifera*, &c., &c. This portion of our little State has not been explored, as evidenced by the fact that I found *Pedicularis lanceolata* in abundance by a road-side, although it is not recorded in our flora. In May and June the Callopogons, Pogonias and Habenarias are superb in Exeter. I hope to do more careful work there.—W. W. BAILEY.

NOMENCLATURE.—I desire to protest against the prevailing abuse of personal nomenclature. Botanical names are for all time, and even if it is of interest to us to know that Jones discovered a certain plant, future generations won't care a fig whether Tom, Dick or Harry first stumbled upon it. Possibly it may stimulate research somewhat, and the botanist who abuses it most may get more new plants thereby, but the work can be done just as well without it. The "holy fires of science in the human breast" cannot be perceptibly dampened by the removal of so selfish a motive. If the collector feels that he must write his name in imperishable letters, let him get a mallet and chisel and hie him to the Pyramids, Give us a name expressive of some salient peculiarity or of locality or range, but don't, *don't* call it Smithia Brownii! If the abuse goes on much longer, I verily believe that, before the final hardening of Descriptive Botany, the great majority of personal names will be expunged.—D.

BOTRYCHIUM LUNAROIDES VAR. OBLIQUUM.—In February number, 1877, notice is taken of *Botrychium Virginianum* with forking spikes. My son, Master George C. Spence, found a *B. lunaroides* var. *obliquum* with *two* distinct and entirely disconnected fertile spikes. There was no sacrifice or stinting of parts to produce this extra fruitage, but on the contrary the effort was followed by an unusual development of beauty and vigor in the plant proper, as the main spike, starting from the usual point, reached the height of fourteen inches, with a fruitage of five and one-half inches inclusive. The extra spike grew on the petiole of the frond, two inches from base of the frond and one inch from main spike. This was nine inches high, with two inches of fruit as large and well developed as is usual in the ordinary plant. There was nothing whatever to indicate that injury to the plant was the cause of this very unusual development.—MRS. E. J. SPENCE.

VARIATIONS.—Last spring I found a double flowering Claytonia; a *Uvularia grandiflora* with 8 petals, 8 stamens, 4 stigmas, and a 4-celled ovary; a tulip (in the garden) with 8 petals, 8 stamens and 8 stigmas; a tulip with 8 petals, 12 stamens, 3 of them united to the ovary, which was imperfectly 4-celled; another tulip with 7 petals, 7 stamens and 3 stigmas, and still another with 5 petals, 7 stamens and 3 stigmas; also a *Viola cucullata*, the blue flowers of which were beautifully striped with white. I have some of them in my garden.—A. HUBREGTSE.

RECENT PUBLICATIONS.—*American Journal of Science and Arts*, February.—Sereno Watson gives a synopsis of the North American species of *Populus*, and has requested that notes on any species of Populus, with specimens, be sent to the Herbarium of Harvard University, Cambridge, Mass. It will be a benefit to science for all who have such notes or specimens to comply with this request, for by this means Mr. Watson will be able to place the species of this difficult genus upon surer foundation than ever before. "Specimens may be sent by mail fresh from the tree, without the trouble of

pressing or drying, by wrapping them in an ordinary newspaper." The species enumerated are seven, viz: *P. tremuloides*, Mx., *P. grandidentata*, Mx., *P. heterophylla*, L., *P. balsamifera*, L., with two varieties, *candicans*, Gr., and *Californica*, Watson, *P. angustifolia*, James, *P. trichocarpa*, T. & G., and the var. *cupulata*, Watson, *P. monilifera*, Ait., and *P. Fremonti*, Watson, with the var. (?) *Wislizeni*.

The American Naturalist, February and March.—In the latter number we have two botanical articles: "The Transpiration of Plants," by J. M. Anders, and "Rambles of a Botanist in New Mexico," by E. L. Greene. Both are interesting and deserve a fuller notice than our crowded pages permit us to give.

A Synopsis of the American Firs, by Dr. Geo. Engelmann.—Dr. Engelmann takes up one difficult genus after another, and by the most patient and conscientious work brings order out of confusion. The species of *Abies* have long been confused, but now the sub-divisions of the genus are based upon leaf-structure, principally the two resin ducts, with greater certainty than on the length of the bracts, as was formerly done. "It is a most interesting as well as significant fact that while the anatomical structure of the leaves of higher organized plants shows considerable uniformity, so that it rarely can be made available for diagnostic purposes, the conifers exhibit such a wonderful variety of leaf structure (approaching thereby the lowest orders of vascular plants), that often a single leaf is sufficient to recognize the genus, and often the species, even when the ordinary characters may leave us in doubt." Nine species are enumerated, viz: *A. Fraseri*, Lindl., *A. balsamea*, Marshall, *A. subalpina*, Engelm., with var. *fallax*, *A. grandis*, Lindl., and var. *densifolia*, *A. concolor*, Lindl., *A. religiosa*, Schlecht., *A. bracteata*, Nutt., *A. nobilis*, Lindl., and *A. magnifica*, Murray.

Ferns of North America, by Prof. D. C. Eaton, Parts II and III.—The second and third parts of this splendid work are fully equal, if not superior in fine workmanship to the first, and Mr. S. E. Casino is to be congratulated upon its fine typographical appearance. In Part II there are three plates, containing seven species, and descriptions of six. The species are *Asplenium ebeneum*, Ait., *A ebenoides*, R. R. Scott, *Botrychium lunaria*, Swartz, *B, lanceolatum*, Angstrom, *B. boreale*, Milde, *Cheilanthes lanuginosa*, Nutt., and *C. Californica*, Mett. The specimens of *Asplenium ebeneum* found in considerable abundance in this county are much more luxuriant in habit than the one figured, but not more so than is provided for in the text. The figure of *A. ebenoides* shows well its supposed hybrid character, the long, tapering, proliferous tip much resembling *Camptosorus rhizophyllus*, and its other features like *A. ebeneum*. Prof. Eaton recommends the attempt to produce this plant by artificial hybridizing, and thus establish its true hybrid character or not. *Botrychium boreale* is figured and described although collected but once in North America and that by Chamisso, sixty years ago in Unalaska. Its appearance in this work, however, may aid in its re-discovery. In Part III five species are figured, viz: *Aspidium Noveboracense*, Swartz, *Camptosorus rhizophyllus*, Link, *Asplenium pinnatifidum*, Nutt., *Notholæna Fendleri*, Kunze, and *N. dealbata*, Kunze.

Catalogue of the Phænogamous and Vascular Cryptogamous Plants found growing wild in Jefferson county, Ind. This catalogue is compiled by Mr. Chas. R. Barnes, and Mr. Jno. F. Baird adds a short list of plants growing in Clark county, not as yet found in Jefferson. The Jefferson county catalogue numbers 912 species through the Vascular cryptogamia, and hence forms a valuable check list. Any one desiring copies of it can be supplied by writing to Mr. Chas. R. Barnes, Madison, Ind.